MACRO VISION ACADEMY, BURHANPUR

Sample Paper 2022-23

Office Use

Class: XI Mathematics **Time : 90 min** **M.M.: 50**

Student's Name:-_____ **Father's Name:-**_____

City:-_____**Mobile No:-**_____ **Exam Date:-**_____

Studying in Class:_ _____ **Appearing for class:-**_____ **Board: MP/CBSE/Other**_____

GENERAL INSTRUCTIONS:

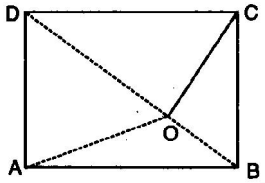
- The question paper has 50 questions in all. Each question carries 1 mark.
- All questions are compulsory.
- Section A contains 20 questions of Mathematics.
- Section B contains 10 questions of Physics.
- Section C contains 10 questions of Chemistry.
- Section D contains 5 questions of MAT (Mental Ability Test).
- Section E contains 5 questions of English.

Mathematics (20)	Physics (10)	Chemistry (10)	MAT (05)	English (05)	OBTAINED (50)

Section A

Mathematics

1. Let 0 be any point inside a rectangle $ABCD$, then:



(a) $OA^2+OC^2=OB^2+OD^2$ (b) $OA^2+OB^2=OC^2+OD^2$

(c) $OA^2+OD^2=OB^2+OC^2$ (d) $OA^2-OC^2=OB^2-OD^2$

2. The smallest number, by which $\frac{1}{7}$ be multiplied so that its decimal expansion terminate after one place of decimal, is:

(a) 10 (b) $1\frac{3}{7}$ (c) $\frac{7}{10}$ (d) $\frac{1}{7}$

3. If $a_1, a_2, a_3, a_4, \ldots$ are the consecutive terms of an A.P. Its fifth term is:

(a) sum of first 5 terms — sum of first 4 terms

(b) (sum of first term + sum of first ten terms) ÷ 2

(c) $(a_1+a_{10})\div 2$

(d) (sum of first five terms — sum of four terms) ÷ 2

4. If the zeroes of the quadratic polynomial $x^2+(a+1)x+b$ are 2 and –3, then:

(a) $a=-7,b=-1$ (b) $a=5,b=-1$ (c) $a=2,b=-6$ (d) $a=0,b=-6$

5. The point which divides the join of points (–8, –5) and (–2, 10) in the ratio 2: 1 internally lies in the:

(a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant

6. The points A(–4, 0), B(4, 0) and C(0, 3) are the vertices of a triangle, which is

(a) isosceles (b) equilateral (c) scalene (d) right angled

7. A quadrilateral *ABCD* circumscribes a circle with centre *O*, the sum of the $\angle AOB$ and $\angle COD$ is:

(a) 90^0 (b) 135^0 (c) 150^0 (d) 180^0

8. The probability that a number selected at random from the natural numbers 1 to 15 is a multiple of 4, is

(a) $\frac{4}{15}$ (b) $\frac{2}{15}$ (c) $\frac{1}{5}$ (d) $\frac{1}{3}$

9. For the following distribution:

Marks	Number of students
Below 10	3
Below 20	12
Below 30	27
Below 40	57
Below 50	75
Below 60	80

The modal class is:

(a) 10-20 (b) 20-30 (c) 30-40 (d) 50-60

10. If the lines given by $3x+2ky=2$ and $2x+5y+1=0$ are parallel, then the value of k is:

(a) $-\frac{5}{4}$ (b) $\frac{2}{5}$ (c) $\frac{15}{4}$ (d) $\frac{3}{2}$

11. The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm is:

(a) 31 cm (b) 25 cm (c) 62 cm (d) 50 cm

12. A kite is flying at a height of 30 m and its lower end is attached to a point on the ground. If the string of the kite makes an angle of $60°$ with the ground, the length of the string used is:

(a) 30 m (b) $20\sqrt{3}m$ (c) $30\sqrt{3}m$ (d) 60 m

13. Twelve solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 2 cm and height 16 cm. The diameter of each sphere is:

(a) 4 cm (b) 3 cm (c) 2 cm (d) 6 cm

14. If $\sin A + \sin^2 A = 1$, then $\cos^2 A + \cos^4 A$ is:

(a) $\frac{1}{2}$ (b) 1 (c) 2 (d) 3

15. Which of the following equation has no real roots?

(a) $x^2 - 4x + 3\sqrt{2} = 0$ (b) $x^2 + 4x - 3\sqrt{2} = 0$ (c) $x^2 - 4x - 3\sqrt{2} = 0$ (d) $3x^2 + 4\sqrt{3}x + 4 = 0$

16. Volumes of two spheres are in the ratio 64 : 27. The ratio of their surface areas is:

(a) 3:4 (b) 4:3 (c) 9:16 (d) 16:9

17. The first four terms of an A.P., whose first term is –2 and the common difference is –2 are:

(a) –2, 0, 2, 4 (b) –2, 4, –8, 16 (c) –2, –4, –6, –8 (d) –2, –4, –8, –16

18. The value of $\sin 20° \sin 40° \sec 70° \sec 50°$ is:

(a) 0 (b) 2 (c) –1 (d) 1

19. The roots of the equation $2x^2 - 6x + 7 = 0$ are

(a) real, unequal and rational (b) real, unequal and irrational

(c) real and equal (d) imaginary

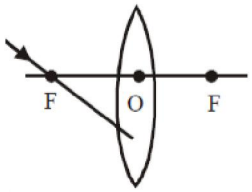
20. A chord of a circle of radius 10 cm subtends a right angle at the centre. The area of the minor segment (given, $\pi = 3.14$) is

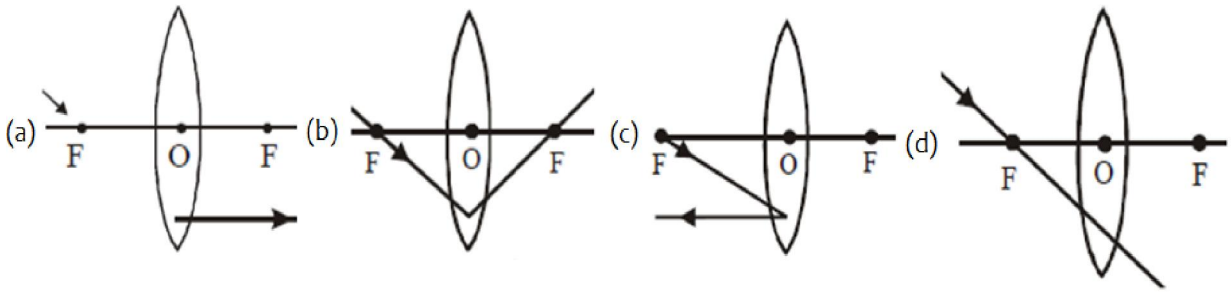
(a) 32.5 cm^2 (b) 34.5 cm^2 (c) 28.5 cm^2 (d) 30.5 cm^2

Section B

Physics

21. Which of the following ray diagrams is correct for the ray of light incident on a lens shown in Fig?





22. When a ray of light passes from an optically denser medium to a rarer medium, it

(a) goes undeviated (b) bends away from the normal

(c) bends towards the normal (d) none of these

23. Power rating of an electric appliance indicates

(a) Brightness of the light (b) The rate of consumption of electrical energy

(c) Amount of heat evolved (d) Quality of the appliance

24. Consider the following statements:

(i) Magnetic field produced by current in a straight wire has no poles.

(ii) The magnetic lines of force produced by a straight current carrying conductor are straight in nature.

(iii) To produce a strong magnetic field at its centre, we prefer a current carrying wire loop of larger radius.

Which of these statement(s) is/are correct?

(a) (ii) and (iii) (b) (ii) only (c) (i) only (d) All are incorrect

Passage based questions

DIRECTIONS (Qs. 25 to 27): Read the passage given below and answer the questions that follow.

The electric generator is a machine for producing electric current. The electric generator or dynamo converts mechanical energy into electrical energy. The generator is an application of electromagnetic induction. It works on the principle that when a wire is moved in a magnetic field, then the current is induced in the coil. A rectangular coil is made to rotate rapidly in the magnetic field between the poles of a horse shoe type magnet. When the coil rotates, it cuts the lines of magnetic force, due to which a current is produced in the generator coil. This current can be used to run the various electrical appliances.

25. An electric generator actually acts as

(a) source of electric charge (b) source of heat energy

(c) an electromagnet (d) a converter of energy

26. Electromagnetic induction is the

(i) charging of a body with a positive charge

(ii) production of current by relative motion between a magnet and a coil

(iii) rotation of the coil of an electric motor

(iv) generation of magnetic field due to a current carrying solenoid

(a) (iii) and (iv) (b) (i) and (iv) (c) (ii) and (iii) (d) only (ii)

27. The brushes used in electric generator is made of which material

(a) Carbon (b) Aluminium (c) Zinc (d) Soft iron

28. Identify Correct relations:

(a) 1hp = 746watt (b) 1kWh = 3.6×10^4 joule

(c) 1 watt = 1 volt × 1 ohm (d) 1 ohm= 1 volt × 1 ampere

29. Which of the following are not characteristics of a good source of energy?

(i) which would do a less amount of work per unit volume or mass

(ii) be easily accessible

(iii) be difficult to store and transport

(iv) be economical.

(a) (iii) and (iv) (b) (i) and (iii) (c) (ii) and (iii) (d) only (iii)

30. Choose correct statement/s

(i) A body has a uniform motion if it travels equal distances in unequal intervals of time.

(ii) A body has a non-uniform motion if it travels unequal distances in equal intervals of time.

(iii) Distance travelled by a moving body in (one second) unit time is called speed.

(iv) Average velocity is given by the arithmetic mean of initial velocity and final velocity for a given period of time.

(a) (ii) and (iv) (b) (i) and (ii) (c) (ii) and (iii) (d) only (ii)

Section C

Chemistry

31. The number of molecules of water of crystallisation present in washing soda crystals is

(a) Five (b) Two (c) Ten (d) Seven

32. Oily and fatty food items are flushed with nitrogen gas because :

(a) Nitrogen reacts with oils and fats and thus prevents rancidity.

(b) Nitrogen is inert gas and prevent a direct contact of air with oily and fatty food items

(c) Nitrogen helps in the decomposition of food items and makes them tasty

(d) All given statements are wrong

33. The elements A, B and C belongs to group 2, 14 and 17 respectively of the periodic table. Which two elements form ionic compounds?

(a) A and B (b) A and C (c) B and C (d) None

34. If a moist blue litmus paper is brought near CO_2 gas

(a) It will remain blue (b) It will change to red

(c) It will become colourless (d) It will catch fire

35. On the basis of following features identify correct option

I. All elements of this group are gases

II. All elements are chemically inert under ordinary conditions.

(a) Group 18 (b) Group 17 (c) Group 14 (d) Group 16

PASSAGE

When an element exists in two or more forms without changing its state and has different physical properties but the same chemical properties, the different forms are known as **allotropic form** or **allotropes** of that element, and the phenomenon is called **allotropy**. Pure carbon exists in both *crystalline* and *amorphous* form.

Crystalline: Diamond, graphite.

Amorphous: Charcoal, coal, coke, carbon black.

36. An element exists in different allotropic forms because of

(a) different arrangement of atoms

(b) different amounts of energy associated in the formation of each allotropic form

(c) different methods of formation

(d) All the above are correct

37. Which of the following allotropes of carbon is used for manufacture of fullerenes?

(a) Graphite (b) Diamond (c) Coke (d) Charcoal

38. Which statement best confirms that two substances are allotropes of carbon ?

(a) They both reduce heated iron (III) oxide to iron,

(b) They have different crystalline structures.

(c) Equal masses of the substances require equal masses of oxygen for complete combustion.

(d) Equal masses of the substances require equal masses of carbon dioxide, and no other product, when completely burnt in oxygen.

39. Removal of impurities from ore is known as -

(a) crushing and grinding (b) concentration of ore

(c) calcinations (d) roasting

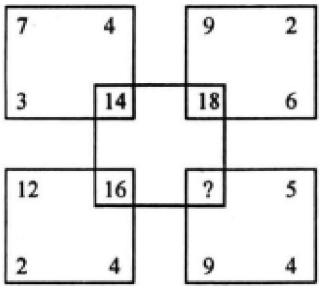
40. Which reducing agent is used in chemical reduction?

(a) C (b) Cs (c) Na (d) Ca

Section D

MAT

41. What number should replace the question mark?

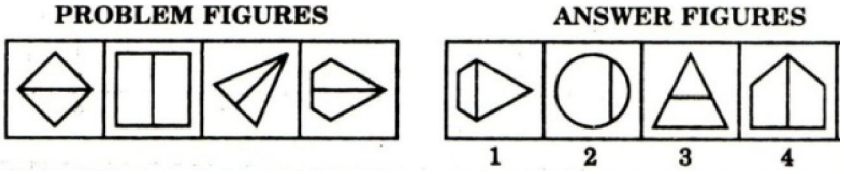


(a) 45 (b) 30 (c) 52 (d) 18

42. Which of the following diagrams indicates the best relation among Women, Mothers and Engineers?

(a)  (b)  (c)  (d) 

43. Which answer figure has the same as problem figure?



(a) 1 (b) 2 (c) 3 (d) 4

44. Which term will fit in question mark?

1, 6, 15, ?, 45, 66, 91

(a) 25 (b) 26 (c) 27 (d) 28

45. Find the next term in the following series

POQ, SRT, VUW, ...

(a) XYX (b) XZY (c) ZYX (d) YXZ

Section E

English

Read the following passage and answer the questions by choosing the correct option. (Q. 46 – Q. 50)

Trampolines

What's more fun than standing still? Jumping up and down on a springy piece of fabric! This activity is known as trampolining and it's sweeping the nation.

The idea of trampolining is ancient. Eskimos have been tossing each other in the air using walrus skin for thousands of years. Firemen began using a life net to catch people jumping from buildings in 1887. And in the early 1900s, circus performers began bouncing off of netting to amuse audiences. These weren't the same as today's trampolines, but they show that the idea has been bouncing around for a long time.

A tumbler named George Nissan and his coach Larry Griswold made the first modern trampoline in 1936. They got the idea by watching trapeze artists bouncing off of a tight-net at the circus. The two men experimented with different fabrics and designs. They found a winner when they stretched a piece of canvas across a steel frame and held it in place with springs. They named their device after the Spanish word trampolin, which means diving board.

At first Nissan and Griswold used their device to train tumblers. The piece of training equipment was a lot of fun. They realized that everyone could enjoy their trampoline, not just tumblers. The men wanted to share their idea with the whole world. In 1942 they began making trampolines to sell to the public.

Trampolines may be fun, but they can also be dangerous. Experts estimate that more than 100,000 people hurt themselves while using one each year. Clubs and gyms use large safety nets and rubber padding to make it safer. Most trampoline injuries happen at home. Since trampolines are more affordable than ever, injuries are even more common.

These injuries happen for many reasons. People may bounce too high and land off of the trampoline or onto the springs. From the peak of the bounce, this can be a fall of 13 feet or more. Injuries also happen when many people are jumping at the same time. Jumpers may collide and cause one another to land in strange ways. Lots of people have broken bones in this way. Perhaps the worst injuries happen when untrained people try to do flips. Landing on your neck or head can paralyze or even kill you.

But don't let all that bad news keep you down. There are many things that you can do to practice safe trampolining. You can cover the springs with special pads so that people's limbs are less likely to get stuck in them. You can surround your trampoline with a net so that people don't fall off of it. You can limit bouncers to one at a time. This will prevent collision injuries. Perhaps most importantly, you should never flip on a trampoline without professional guidance. You are much less likely to get hurt on a trampoline if you do these things.

Trampolines have been around for a while now. They have brought a lot of joy to many people. There is no feeling quite like soaring up in the air and then free-falling. Trampolines can also be a good source of exercise and activity. They can help people improve their balance and

aerial moves. But they can also be deadly. Be sure that you are practicing safety while having a good time. Happy bouncing!

46. Which statement would the author most likely disagree with?
    (a) The basic idea of a trampoline has been around for a long time.
    (b) Nissan and Griswold owe much of their success to circus performers.
    (c) Most club and gym trampolines are safer than most home trampolines.
    (d) Trampolines are dangerous and not much can be done to make them safer.

47. Which best describes the main idea in the second paragraph?
    (a) It explains how Eskimo have used walrus skins like trampolines for a long time.
    (b) It describes activities similar to trampolining that came first.
    (c) It compares and contrasts how different groups have used trampolines.
    (d) It discusses how trampolining is ancient.

48. Which of the following events happened first?
    (a) Firemen begin using life nets to catch people jumping from buildings.
    (b) Nissan and Griswold begin selling trampolines to the public.
    (c) Circus performers begin using netting to perform tricks.
    (d) Nissan and Griswold invent the modern trampoline.

49. Which is not cited as a cause of trampoline related injuries?
    (a) Colliding with other bouncers (b) Bouncing into low hanging objects
    (c) Jumping off of the trampoline (d) Landing a flip incorrectly

50. Which best explains why trampoline injuries are more likely to happen at home?
    (a) Home trampolines get rained on and become very slippery.
    (b) Home trampolines are cheaply made and fall apart during use.
    (c) Home trampolines often lack proper safety equipment.
    (d) Most people are on their best behavior when they leave the home.

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